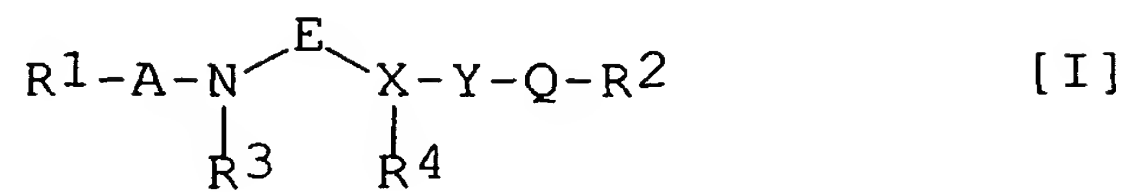


C L A I M S

1. A compound of the formula:

5



wherein R^1 is acyl,

10

R^2 is lower alkyl, lower alkoxy, lower alkylamino, lower alkenyl, lower alkenyloxy, lower alkenylamino, lower alkynyl, lower alkynyloxy, lower alkynylamino, cyclo(lower)alkyl, cyclo(lower)alkyloxy, cyclo(lower)alkylamino, aryl, aryloxy, arylamino, a heterocyclic group or amino substituted with a heterocyclic group, each of which may be substituted with suitable substituent(s); or acyl;

15

20

A is a single bond, $\text{-}\overset{\text{O}}{\parallel}\text{C-}$ or $\text{-SO}_2\text{-}$,

E is lower alkylene optionally substituted with suitable substituent(s),

25

X is CH or N,

Y is a single bond, lower alkylene or $\text{-}\overset{\text{R}^5}{\underset{|}{\text{N}}}\text{-}$ (wherein R^5 is hydrogen, lower alkyl, substituted-lower alkyl, an N-protective group, aryl, acyl or a heterocyclic group),

30

Q is $\text{-CH}_2\text{-}$, $\text{-}\overset{\text{O}}{\parallel}\text{C-}$, $\text{-SO}_2\text{-}$ or -N=CH- , and

R^3 and R^4 are each hydrogen or lower alkyl, or are taken together to form lower alkylene optionally condensed with a cyclic hydrocarbon or a heterocyclic ring,

35

provided that when X is N,

then 1) Y is a single bond, and

Q is $-\text{CH}_2-$, $-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-$ or $-\text{SO}_2-$, or

5 2) Y is lower alkylene,

and pharmaceutically acceptable salt thereof.

2. A compound according to claim 1, wherein

10 R^2 is aryl, aryloxy or arylamino, each aryl of which
may be substituted with halogen; pyridyl; or
pyridylamino;

A is a single bond,

E is ethylene,

X is CH or N,

15 Y is a single bond, lower alkylene or $-\overset{\text{R}^5}{\underset{|}{\text{N}}}-$
(wherein R^5 is hydrogen, lower alkyl or
an N-protective group),

Q is $-\text{CH}_2-$, $-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-$ or $-\text{SO}_2-$, and

20 R^3 and R^4 are taken together to form ethylene.

3. A compound according to claim 2, wherein

25 R^1 is lower alkanoyl, esterified carboxy, substituted
or unsubstituted aroyl, lower alkylsulfonyl,
substituted or unsubstituted arylsulfonyl, or
cyclo(lower)alkylcarbonyl, and

R^2 is aryl or arylamino, each aryl of which may be
substituted with halogen.

30 4. A compound according to claim 3, wherein

R^1 is lower alkanoyl, lower alkoxycarbonyl, aroyl,
aroyl substituted with halo(lower)alkoxy, lower
alkylsulfonyl, arylsulfonyl, arylsulfonyl
substituted with halogen, or
35 cyclo(lower)alkylcarbonyl,

X is CH,

Y is a single bond or $\begin{array}{c} \text{H} \\ | \\ -\text{N}- \end{array}$, and

5 Q is $\begin{array}{c} \text{O} \\ || \\ -\text{C}- \end{array}$ or $-\text{SO}_2-$.

5. A compound according to claim 3, wherein
 R^1 is lower alkanoyl, lower alkoxy carbonyl, aroyl,
 10 aroyl substituted with halo(lower)alkoxy, lower
 alkylsulfonyl, arylsulfonyl, arylsulfonyl
 substituted with halogen, or
 cyclo(lower)alkylcarbonyl,

X is N,

Y is a single bond or lower alkylene, and

15 Q is $\begin{array}{c} \text{O} \\ || \\ -\text{C}- \end{array}$ or $-\text{SO}_2-$.

6. A compound according to claim 4, wherein

20 Y is $\begin{array}{c} \text{H} \\ | \\ -\text{N}- \end{array}$, and

Q is $\begin{array}{c} \text{O} \\ || \\ -\text{C}- \end{array}$.

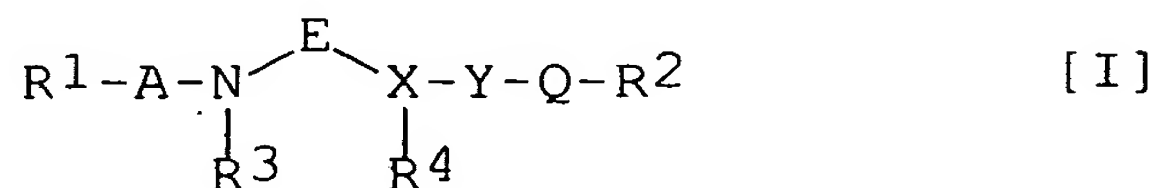
7. A compound according to claim 5, wherein

25 Y is a single bond, and

Q is $\begin{array}{c} \text{O} \\ || \\ -\text{C}- \end{array}$.

8. A process for preparing a compound of the formula:

30



wherein R^1 is acyl,

R^2 is lower alkyl, lower alkoxy, lower
 alkylamino, lower alkenyl, lower
 alkenyloxy, lower alkenylamino, lower
 alkynyl, lower alkynyloxy, lower
 alkynylamino, cyclo(lower)alkyl,
 cyclo(lower)alkyloxy,
 cyclo(lower)alkylamino, aryl, aryloxy,
 arylamino, a heterocyclic group or amino
 substituted with a heterocyclic group,
 each of which may be substituted with
 suitable substituent(s); or acyl;

A is a single bond, $\overset{\text{O}}{\parallel}\text{C}-$ or $-\text{SO}_2-$,
 E is lower alkylene optionally substituted with
 suitable substituent(s),

X is CH or N,

Y is a single bond, lower alkylene or $-\overset{\text{R}^5}{\underset{|}{\text{N}}}-$
 (wherein R^5 is hydrogen, lower alkyl,
 substituted-lower alkyl, an N-protective
 group, aryl, acyl or a heterocyclic group),

Q is $-\text{CH}_2-$, $\overset{\text{O}}{\parallel}\text{C}-$, $-\text{SO}_2-$ or $-\text{N}=\text{CH}-$, and
 R^3 and R^4 are each hydrogen or lower alkyl, or
 are taken together to form lower alkylene
 optionally condensed with a cyclic
 hydrocarbon or a heterocyclic ring,

provided that when X is N,

then 1) Y is a single bond, and

Q is $-\text{CH}_2-$, $\overset{\text{O}}{\parallel}\text{C}-$ or $-\text{SO}_2-$, or
 2) Y is lower alkylene,

or pharmaceutically acceptable salt thereof,
 which comprises,

1) reacting a compound of the formula:

5



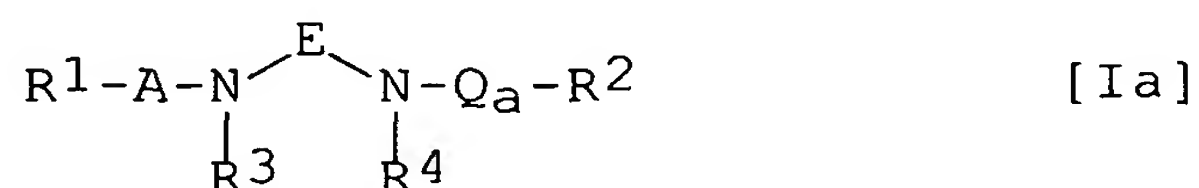
or its salt with a compound of the formula:

10



or its reactive derivative at the carboxy or sulfo group, or a salt thereof to provide a compound of the formula:

15



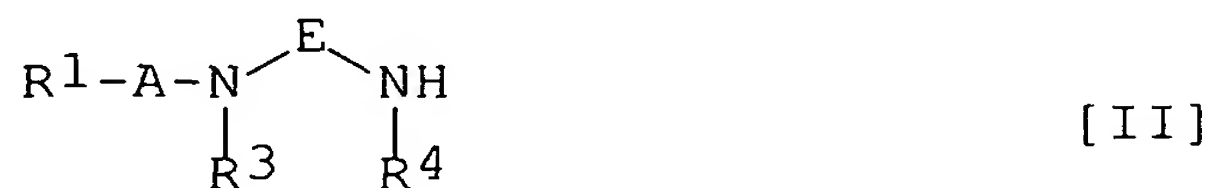
or its salt, in the above formulas,
 R^1 , R^2 , R^3 , R^4 , A and E are each as defined above, and

20

Q_a is $\text{-}\overset{\text{O}}{\parallel}\text{C-}$ or $\text{-SO}_2\text{-}$, or

2) reacting a compound of the formula:

25

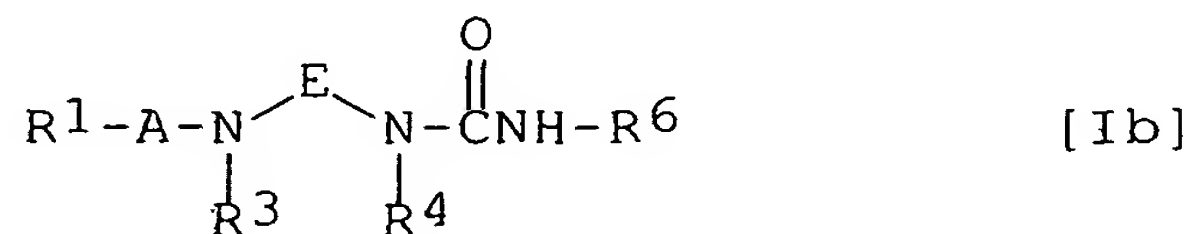


or its salt with a compound of the formula:

30

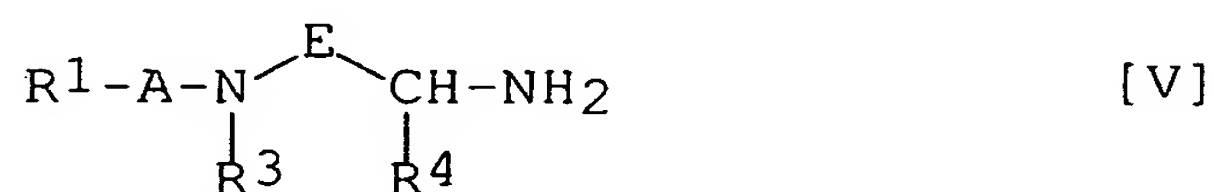


to provide a compound of the formula:



or its salt, in the above formulas,
 R^1 , R^3 , R^4 , A and E are each as defined above, and
 R^6 is aryl which may be substituted with suitable
 substituent(s); or pyridyl, or

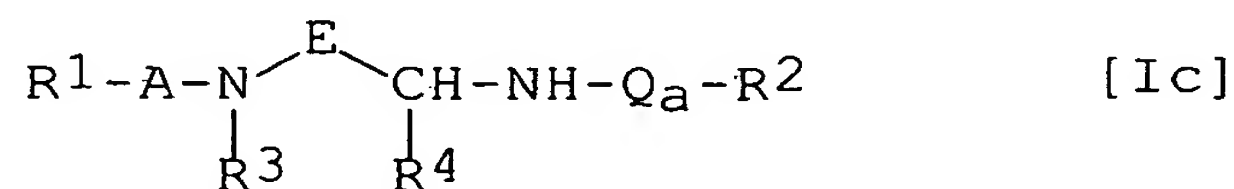
3) reacting a compound of the formula:



or its salt with a compound of the formula:

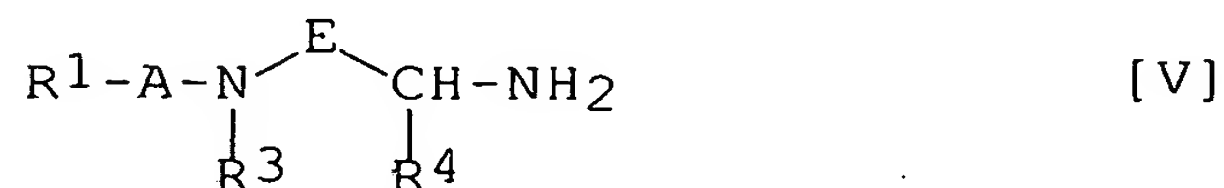


or its reactive derivative at the carboxy or sulfo
 group, or a salt thereof to provide a compound of the
 formula:



or its salt, in the above formulas,
 R^1 , R^2 , R^3 , R^4 , A, E and Q_a are each as defined above,
 or

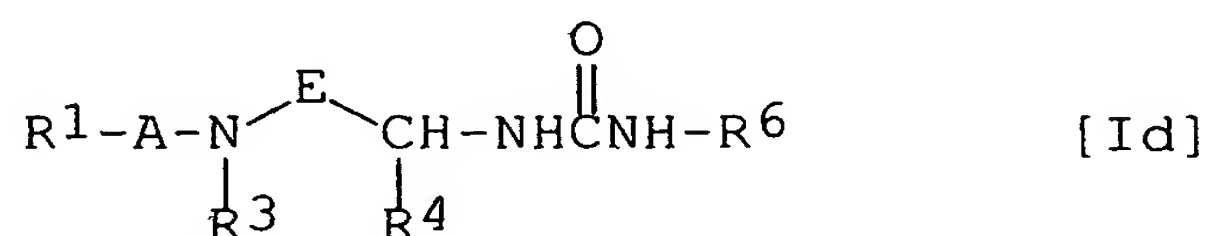
4) reacting a compound of the formula:



or its salt with a compound of the formula:

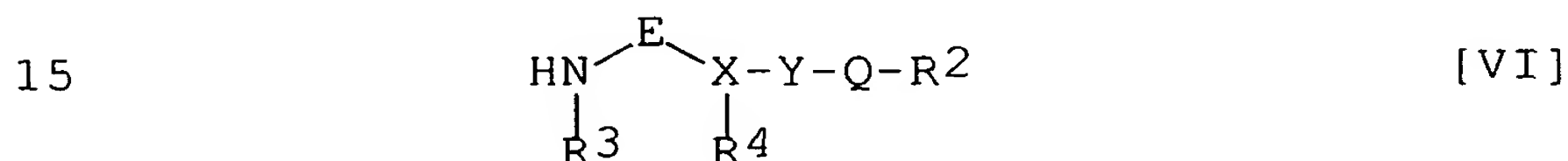


5 to provide a compound of the formula:

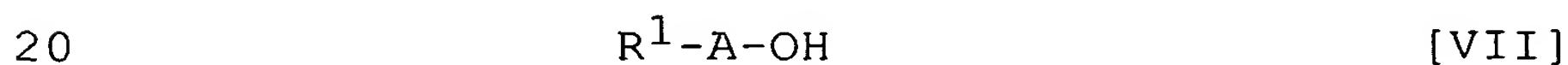


10 or its salt, in the above formulas,
 R^1 , R^3 , R^4 , R^6 , A and E are each as defined above, or

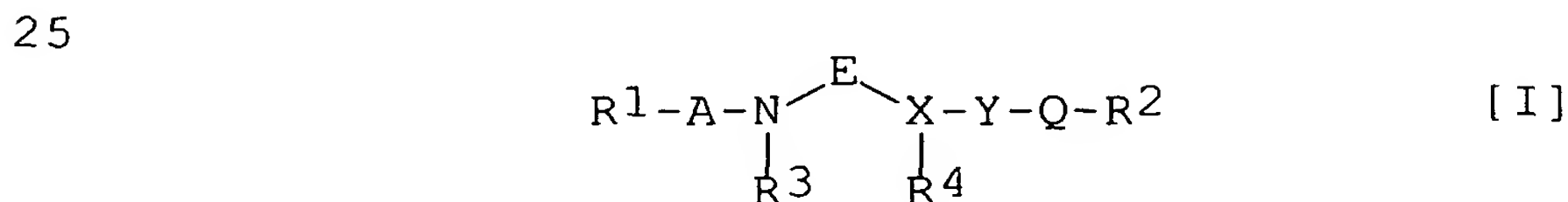
5) reacting a compound of the formula:



or its salt with a compound of the formula:

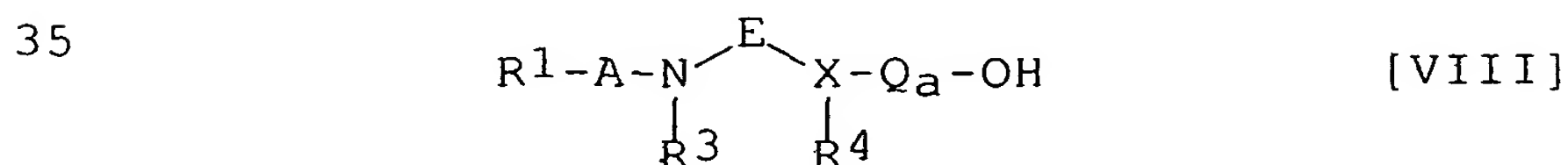


or its reactive derivative at the carboxy or sulfo group, or a salt thereof to provide a compound of the formula:



or its salt, in the above formulas,
 R^1 , R^2 , R^3 , R^4 , A, E, X, Y and Q are each as defined above, or

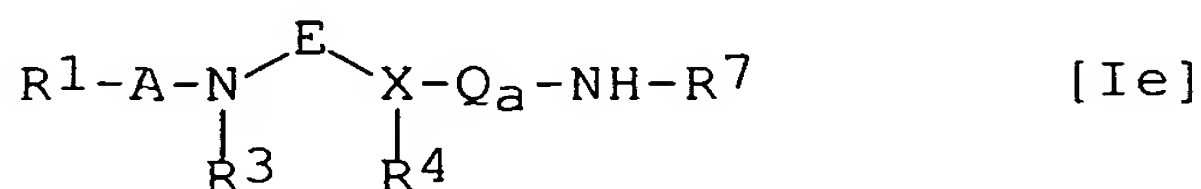
6) reacting a compound of the formula:



or its reactive derivative at the carboxy or sulfo group, or a salt thereof with a compound of the formula:



or its salt to provide a compound of the formula:



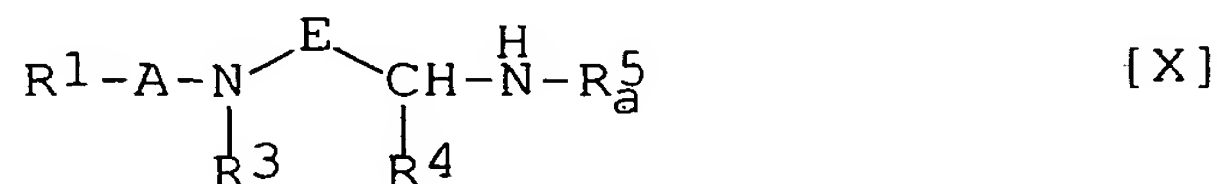
or its salt, in the above formulas,

R^1 , R^3 , R^4 , A, E, X and Q_a are each as defined above,

and

R^7 is lower alkyl, lower alkenyl, lower alkynyl, cyclo(lower)alkyl, aryl or a heterocyclic group, each of which may be substituted with suitable substituent(s), or

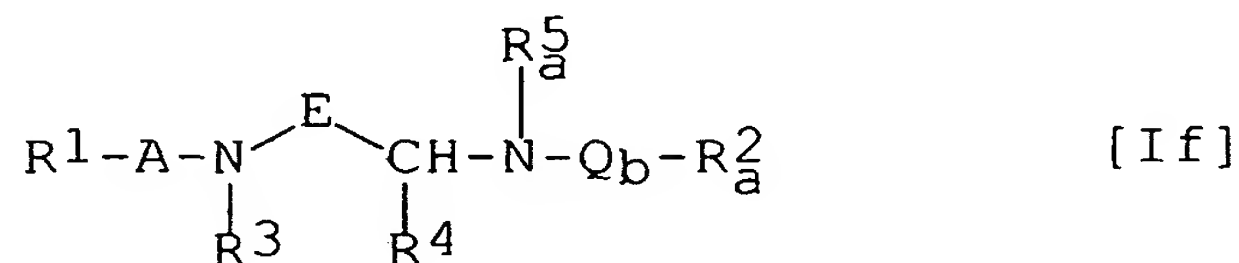
7) reacting a compound of the formula:



or its salt with a compound of the formula:



to provide a compound of the formula:



or its salt, in the above formulas,

R^1 , R^3 , R^4 , A and E are each as defined above,

R_a^5 is an N-protective group,

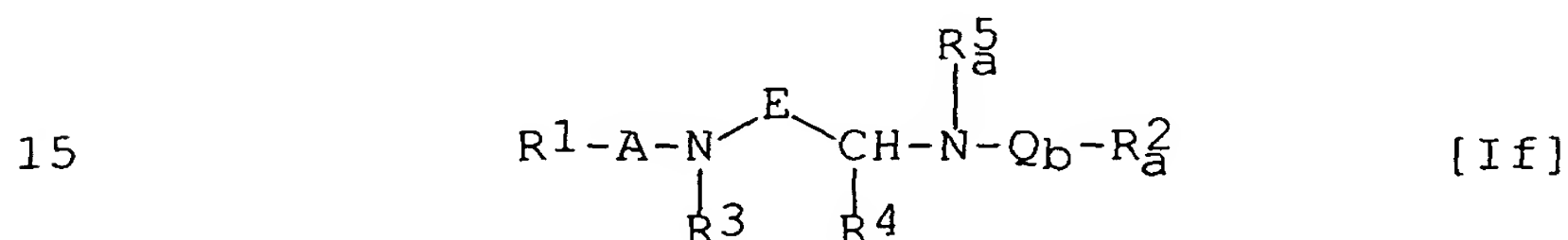
R_a^2 is lower alkyl, lower alkenyl, lower alkynyl,

5 cyclo(lower)alkyl, aryl or a heterocyclic group,
each of which may be substituted with suitable
substituent(s),

Q_b is $-\text{CH}_2-$, $-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-$, $-\text{SO}_2-$, and

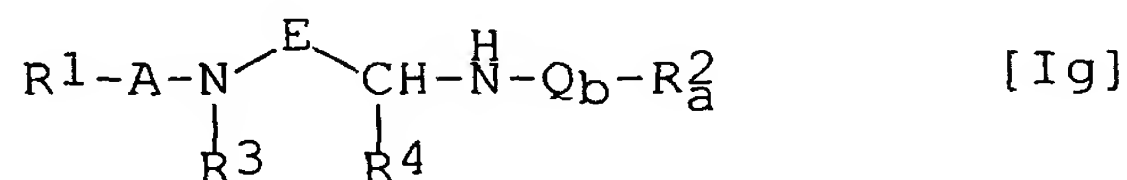
10 Z_a is an acid residue, or

8) subjecting a compound of the formula:



or its salt to elimination reaction of the N-protective
group to provide a compound of the formula:

20

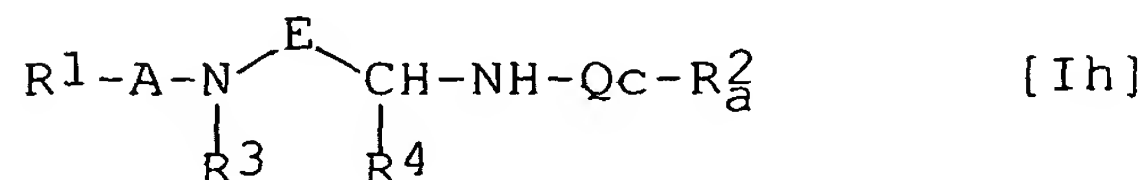


or its salt, in the above formulas,

25 R^1 , R_a^2 , R^3 , R^4 , A, E and Q_b , are each as defined above,
or

9) reacting a compound of the formula:

30

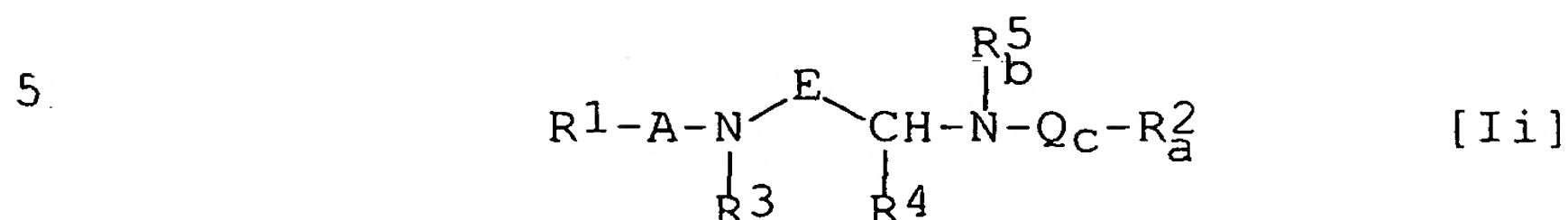


or its salt with a compound of the formula:

35



to provide a compound of the formula:



or its salt, in the above formulas,

10 R^1 , R_a^2 , R^3 , R^4 , A and E are each as defined above,
 Z_b is an acid residue,

Q_c is $\begin{array}{c} O \\ || \\ -C- \end{array}$, and

R_b^5 is lower alkyl, or

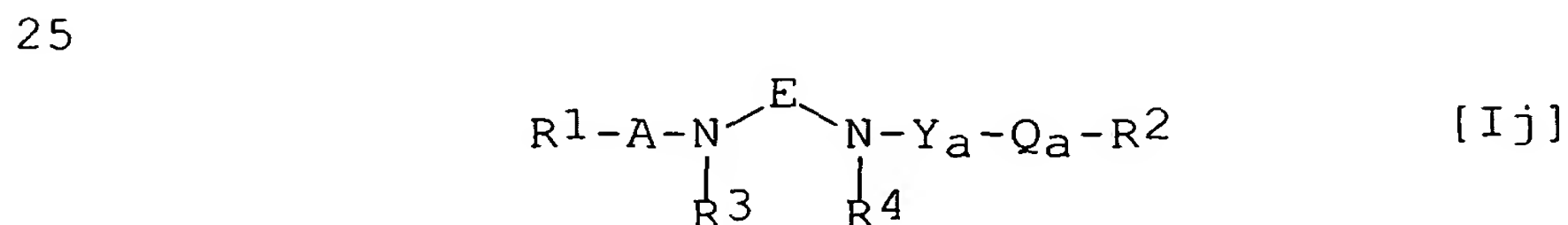
15 10) reacting a compound of the formula:



20 or its salt with a compound of the formula:



to provide a compound of the formula:



or its salt, in the above formulas,

30 R^1 , R^2 , R^3 , R^4 , A, E and Q_a are each as defined above,
 Z_c is an acid residue, and
 Y_a is lower alkylene.

35 9. A pharmaceutical composition comprising a compound of
claim 1, as an active ingredient, in association with a

pharmaceutically acceptable, substantially non-toxic carrier or excipient.

10. A compound of claim 1 for use as a medicament.

5

11. A method for therapeutic treatment and/or prevention of amnesia or dementia which comprises administering an effective amount of a compound of claim 1 to mammals.

10 12. Use of a compound of claim 1 for manufacture of a medicament for treating and/or preventing amnesia or dementia in mammals.

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